DOCUMENT RESUME

ED 427 768 IR 019 423

AUTHOR	Mashhadi, Azam; Deng, Zongyi; Chen, Ai Yen
TITLE	Changing Faces of Distance Learning in Higher Education.
PUB DATE	1998-00-00
NOTE	13p.; Paper presented at the Malaysian Educational Research Association (MERA) Conference (1st, Penang, Malaysia, April 28-30, 1998).
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Managed Instruction; *Distance Education; Foreign Countries; *Higher Education; *Instructional Effectiveness; Nontraditional Education; Teaching Methods
IDENTIFIERS	Open University (Great Britain); Singapore; Technology Integration

ABSTRACT

As the use of distance education grows, the question arises as to whether there are inherent limitations to the use of such an approach, due to the fact that learning is culturally and experientially mediated. The effective implementation of digital learning environments involves recognizing that successful teaching and learning involves students engaged in a social process of meaning appropriation. This in turn requires that the whole learning environment, not just the technological infrastructure, is designed as a well orchestrated whole. A brief review is presented in this paper of some of the approaches towards distance learning adopted by higher education institutions in both the West and the East (the Open University, United Kingdom, the Virtual College, part of Singapore Polytechnic, the National University of Singapore). Strengths and limitations of online courses are also highlighted. A list of exemplar sources and URL references are appended. (Author/AEF)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 427 768

Paper presented at the

1st Malaysian Educational Research Association (MERA) Conference

28-30 April 1998 (Penang, Malaysia)

Changing faces of Distance Learning in Higher Education

Azam MASHHADI

DENG Zongyi

CHEN Ai Yen

Address for correspondence: School of Education, National Institute of Education, Nanyang Technological University, 469 Bukit Timah Road, Republic of Singapore 259756

e-mail: mashhadia@nievax.nie.ac.sg

Abstract

The world is becoming a knowledge based economy, and cultures are increasingly being influenced by the new communications and computer technologies. Although many national distance education programmes are at present primarily print based, with broadcast media coming in second, the future for interactive distance learning lies in electronic networked learning environments. A brief review is presented of some of the approaches towards distance learning adopted by some higher education institutions in both the West and the East (e.g. the Open University, UK; the Virtual College, Singapore). The effective implementation of digital learning environments involves more than the introduction of technology. It involves a recognition that successful teaching and learning involves students engaged in a social process of meaning appropriation – this requires that the whole learning environment, not just the technological infrastructure, be designed as a well orchestrated whole.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

A. Mashhadi

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

IR019423

> Our educational culture – a culture based on the campus, the classroom, and on teaching in a time-specific way – has been in place for several hundred years...The new culture is based on the power and the dynamic nature of information technology and telecommunications, which, combined, allow us to deliver education anywhere, at any time, to anyone who needs it.
> Connick (1997: 9)

Introduction

Fueled by the explosion of the information and communication technologies knowledge is becoming the most important of commodities, with the world fast becoming a knowledge based economy. Lifelong learning will be required as skills (and knowledge) become obsolete and are replaced with those necessary for new products and services.

Changing modes of delivering distance education

The early distance education delivery systems were mainly print based. These correspondence courses were effective in providing information to students at a distance unable to attend educational institutions, however, they lacked interactivity. The growth of the Open University in the UK in the 1970s, in particular, resulted in a change in the model. Study at the level of the university became increasingly available to working people, and broadcast media (i.e. TV and radio) was used to bring education into the home (see Harry *et al.*, 1995). As McIsaac (1996: 4) points out models of distance education reflect national policies:

> In Korea, for example, a cable TV channel forms the backbone of the distance education delivery system. Over the past fifteen years, the UK Open University has worked closely with the British Broadcasting Corporation to deliver course materials. China's massive distance education program uses print materials and nationally televised broadcasts. France, with its emphasis on sophisticated technology, uses satellite video transmissions to deliver programs to primary school, secondary school and university students... Indira Gandhi National Open University in India relies heavily on print based materials. Since they have access to only three 30-minute slots of nationally broadcast television each week, they have developed OPENET, a wide area open education network that links the open universities with regional centers using voice, data and images.

Electronic learning environments

Even as different models of virtual learning are being tried out around the world, distance learning over the Internet or by other communication and information technology means is growing at an astonishing pace. Although many national distance education programmes are at present primarily print based, with broadcast media coming in second, the future for interactive distance learning lies in the much hailed electronic networks in which there is:

> ...a seamless networked learning environment that integrates voice, video, and data connections among learners, instructors, experts, virtual libraries, the Internet, and support services. At the center is the distance learner, connected with both real-time and non-real-time links to these resources.
> Chute *et al.* (1997: 75)

The use of electronic networked learning environments does hold out the promise of making the process of education more accessible, effective and cost-efficient. Chute *et al.* (1997: 76) usefully summarise the two types of communication technologies used in electronic networks:

> *Synchronous communication technologies*, such as desktop video teleconferencing and interactive group video teleconferencing, enable live, real-time interaction between instructors and learners. Instructors, subject mater experts, and learners see and hear one another at all sites and engage in interaction similar to face-to-face classroom interaction. *Asynchronous communication technologies*, such as e-mail, multimedia databases, virtual libraries, and the Internet, support non-real-time interactions and access to vast information resources at a time and place convenient to learners.

The convergence of communications and information technologies means that institutions are increasingly adopting telecommunications-based systems (McIsaac and Gunawardena, 1996). The Internet will become central to the delivery of distance education. The Internet is the public 'network of networks' which spans the world and can be accessed through dial-up connections or direct high-speed business links. The Internet carries several kinds of services but for most users today it means two things: the World Wide Web and a universal channel for e-mail (Monahan and Dharm, 1995). The World Wide Web is the point-and-click Internet interface run through browser software, such as Netscape or Mosaic, which is expected to become the standard way of organising and finding information, both on the public Internet and on private

intranets. An intranet is a private internal network based around World Wide Web technology but closed to the outside world. In the future, most organisations are expected to use an intranet as the core for their IT structure, running data-processing activities through web pages that tie into older systems, possibly on mainframe computers. For instance, since intranet and Internet technology is effectively the same, institutions will be able to amend an existing paper prospectus and turn it quickly into an online prospectus. There are also major implications for the design and delivery of courses.

The World Wide Web is an Internet-based hypermedia initiative for global information sharing, and is the incarnation of the concept of cyberspace. The author William Gibson in his futuristic novel *Neuromancer* invented the term 'cyberspace' to describe his vision of a global computer network, linking people, machines, and sources of information in a world through which one could navigate as through a virtual space:

> Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights receding...
> Gibson (1986: 49)

One interpretation of what is meant by the term 'cyberspace' is that it involves the annihilation of space. The information and communications revolutions that have resulted in the Internet have built a means of information exchange which has 'annihilated' distance and time, and accelerated the process of perhaps creating a global community of inquiry (Thornburg, 1994; Silvio, 1995). Marshall McLuhan (1964: 5) in the 1960s argued that:

> As electrically contracted the globe is no more than a village. After three thousand years of explosion, by means of fragmentary and mechanical technologies, the Western world is imploding. During the mechanical ages we had extended our bodies in space. Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned.

In wandering in the multidimensional virtual world of cyberspace people are navigating through a 'mental geography'. However the question does arise as to whether people situated in different cultural and philosophical traditions are moving through the same mental geography.

Challenges and experiences of on-line distance learning

The future of effective distance learning depends on the full exploitation of the dominant claims of distance learning enthusiasts. In considering the effective implementation of on-line courses a number of factors need to be considered: the level and type of technology being utilised (e.g. e-mail, videoconferencing, Web etc.), the design of the course so that the technology is fully integrated into it, the interface between humans and the technology, and perhaps most important of all, the pedagogic design of the course. Teaching inherently involves directing or facilitating the learning of the student or novice. The student will in future have a greater responsibility and a greater autonomy in influencing their own learning but the teacher will still set the direction (influenced by time, space, resource, and curriculum constraints) and try to scaffold the novice's learning (Scardamalia and Bereiter, 1996).

Among the often mentioned strengths of on-line courses are: 1) *inter-connectivity* between people, sites, disciplines, institutions, and nations; 2) *interactivity* within the electronic machines, systems, software and hardware; 3) *immediacy of feedback*; 4) *integration* of subjects, curricula, the products and processes of technology; and 5) increasing *accessibility* (i.e. increasing both access and interaction to larger numbers of individuals). However, unless these features are achieved, with programmes being appropriately designed to further facilitate a student's learning, on-line distance learning will no better than its predecessor - correspondence learning.

There are limitations to any of the technologies being employed, as none of them is able to exactly reproduce the situation of two people meeting face to face or the teacher interacting with a group of students in the classroom. The sensory information that flows between individuals consists not just of words, but all the nuances of body and facial language. To enhance the efficacy of e-mail, for instance, emoticons [e.g. :)] were developed to convey emotional nuances. Teleconferencing is still limited by the slow frame rate of transmission (Jacobs and Rodgers, 1997).

In online courses, since time to formulate questions is not limited students can reflect on the information presented (Black, 1997). Whitelock *et al.* (1997), however, point out that there has been little empirical work on the effectiveness of Virtual Reality Environments in promoting conceptual learning. Most previous research has demonstrated its usefulness for drill and practice 'contextually welded' experiences (i.e. the acquisition of sensory-motor skills). Clift *et al.* (1996) in describing the experience of using electronic networks with student teachers concluded that telecommunication technology is most helpful when the student did not need or want sustained dialogue (e.g. exchanging information). In times of emotional stress prospective teachers wanted the visual reassurance of face-to-face communication. The benefits of using e-mail in undergraduate teaching (e.g. submitting and returning assignments) are reported on by Pitt (1996).

Real-time videoconferencing can provide virtual face-to-face inter-connectivity and interactivity, but still has a number of physical constraints. Jacobs and Rodgers (1997) in describing the experience of a trans-Europe project involving the use of videoconferencing for remote interactive tutorials mention the constraint of the number of students that can be identified on a TV monitor, the quality of the video signal and the lack of perfect synchronisation between the sound and the speaker's lips. Subtle facial and body gestures can be obscured or misinterpreted in a videoconference link, especially in communicating across cultures.

The development of the above and future technologies is fuelled by a desire to ultimately develop and reproduce a true artificial or 'virtual reality' which can reproduce all five sensory modes (Russell, 1997).

The Open University <http://www.open.ac.uk> in the UK is a global leader in distance learning and although it uses the Web to support its goal of providing accessible education it still normally requires students to spend some time on campus in residence. By way of contrast The Virtual College, part of Singapore Polytechnic <http://www.sp.ac.sg/department/vc/modules.htm>, started off by offering virtual courses on computers and multimedia but is offering an increasing number of courses entirely on-line.

In order to better illustrate how on-line distance learning can work in practice the experiences of various individuals and the research literature is amalgamated to form a hypothetical 'case study'. Chu Fung is upgrading his computer skills by being enrolled on a Virtual College course at the Singapore Polytechnic which utilises the latest Web technology. With his Advanced Computing Diploma from the same polytechnic two years ago, Chu Fung did not have much of a problem in learning basic concepts and techniques about computer animation from the Virtual College. Even though access to the Virtual College was not as immediate nor as fast as anticipated Chu Fung was pleased that he could learn at his own time and talk to his lecturers sometimes through e-mail, or the chat facilities. He was, however, frustrated in not being able to consult with course lecturers on-line as readily as he would have liked even though there was technical provision for it as the Virtual College with 39 courses is supported by Singapore ONE's broad bandwidth. There was just too much traffic, and his questions about the more difficult concepts and intriguing problems remained messy and unclear. With a heavy work schedule, Chu Fung found many advantages in being a distance learner and in having ready access to resources but he still appreciated face-to-face communication in tutorial and lab sessions with his peers and tutors. The Virtual College in assessing the experiences of students to date has found that there in delivering courses there has been some replication of the traditional lecture mode. Provision was made for synchronous communication between tutors and students, but practical constraints have meant that lecturers' guidance is often asynchronous. Interaction is largely between student and the technology, with a high level of social interactivity between students (and tutors) not achieved (e.g. the 'chat room' facilities not really taking off). The increasing number of students accessing the computer system has meant that data transmission rates have reduced. It may be the case that even the implementation of Singapore ONE broad bandwidth may not solve the 'traffic problem'.

The Department of Anatomy (National University of Singapore) has been one of the pioneers in putting medical content material on the Web, and has complied a wide range of multimedia resources on the human body. The small intake of high ability medical students, however, has not used the Web-based resources as much as originally intended – mainly because there is no substitute for the real human body.

There is also a high level of interaction between students and tutors in the traditional apprenticeship case study team system of medical education, reducing the need for substitute technological interaction. If the number of students were far larger or of lower ability then the need for technological assistance might be greater.

As the distinction between 'distance education' and 'traditional education' disappears with the increasing use of the new communications and information technologies higher education institutions are having to come to terms with the accelerating process of change in their 'mainstream courses'. The National Institute of Education (Singapore) has adopted an evolutionary, rather an revolutionary, approach to the incorporation of the latest information and communication technologies. The reason for this is partly the usual institutional factors of the high implementation costs, lack of familiarity by faculty staff with information technologies but, more importantly, a recognition of the pedagogical implications of teaching and learning using digital learning environments. As Salomon (1998: 4) points out with regard to implementing computer supported collaborative learning:

> ...what matters is not just the design of a computer tool or program, not even the design of a single task or curricular unit. Rather, the cultivation of minds, which itself requires mindful engagement in a social process of meaning appropriation, requires that the whole learning environment, not just the computer program or tool, be designed as a well orchestrated whole. This includes curriculum, teachers' behaviors, collaborative tasks, mode of peer collaboration and interaction, tasks, learning goals, and the like.

Additionally Cyrs (1997: 1) points out that:

> Teaching at a distance is different from traditional teaching. Many of the skills of good teaching transfer to a distance learning environment, but some additional teaching skills are required. Any instructor who has taught through telephone conferencing, interactive television, on the Internet or World Wide Web, or through desktop television will confirm this assertion.

How to incorporate Web-based technologies, how to change the usual modes of delivery via lectures and tutorials, and how the modes of assessment need to be changed are questions that faculty staff in Singapore and around the world are in the process of answering (see the *Appendix* for additional sources of information).

Conclusion

The future of effective distance learning depends on the full implementation of the dominant claims of distance learning enthusiasts (i.e. inter-connectivity, interactivity, immediacy of feedback, integration, increased accessibility). As the use of distance learning in education grows the question arises as to whether there are inherent limitations to the use of such an approach due to the fact that learning is culturally and experientially mediated. The effective implementation of digital learning environments involves more than the introduction of technology - it involves recognising that successful teaching and learning involves students engaged in a social process of meaning appropriation. This in turn requires that the whole learning environment, not just the technological infrastructure, be designed as a well orchestrated whole.

Acknowledgements

The assistance given by Dr Steven Coombs in the compilation of exemplar web sites providing information on distance learning courses, institutions and sources of further information (*Appendix*) is gratefully acknowledged.

References

Black, J. (1997): *Gray areas* (http://www.news.com/SpecialFeatures/0,5,8353,00.html).

Chute, A. G., Sayers, P. K. and Gardner, R. P. (1997): 'Networked Learning Environments', *New Directions for Teaching and Learning*, No. 71, pp. 75-83.

Clift, R. T., Thomas, L., Levin, J. and Larson, A. (1996): *Learning in Two Contexts: Field and University Influences on the Role of Telecommunications in Teacher Education*, paper presented at the American Educational Research Association Conference (http://www.ed.uiuc.edu/TTA/Papers/AERA96-Learning-in-2-contexts/index.html).

Connick, G. P. (1997): 'Issues and Trends to Take Us into the Twenty-First Century', *New directions for Teaching and Learning*, no. 71, pp. 7-12.

Cyrs, T. E. (1997): 'Editor's Notes', *New Directions for Teaching and Learning*, No. 71, pp. 1-4.

Gibson, W. (1986): *Neuromancer* (Grafton: London).

Harry, K. *et al.* (Eds.) (1995): *Distance education: New perspectives* (Routledge: London).

Jacobs, G. and Rodgers, C. (1997): 'Remote teaching with digital video: a trans-national experience', *British Journal of Educational Technology*, Vol. 28, No. 4, pp. 292-304.

McIsaac, M. S. (1996): 'Learning for the Future', Keynote address at the *First International Distance Education Symposium* (Ankara, Turkey), electronic version downloaded at website: <http://seamonkey.ed.asu.edu/~mcisaac/future/paper.htm> on 20.52 on 22-4-98.

McIsaac, M. S. and Gunawardena, C. N. (1996): 'Distance Education', in D. H. Jonassen (Ed.) *Handbook of research for educational communications and technology* (Simon and Schuster Macmillan: New York), electronic version downloaded at website: <http://seamonkey.ed.asu.edu/~mcisaac/dechapter/> on 20.43 on 22-4-98.

McLuhan, M. (1964): *Understanding Media: the extensions of man* (Routledge: London).

Monahan, B. D. and Dharm, M. (1995): 'The Internet for Educators: A User's Guide', *Educational Technology*, Vol. 35, No. 1, pp. 44-48.

Pitt, M. (1996): 'The use of electronic mail in undergraduate teaching', *British Journal of Educational Technology*, Vol. 27, No. 1, pp. 45-50.

Salomon, G. (1998): 'What Does the Design of Effective CSCL Require and How Do We Study Its Effects?', electronic version downloaded at website: <http://www-cscl95.indiana.edu/cscl95/outlook/

62_Salomon.html> on 15.18 on 22-4-98.

Scardamalia, M. and Bereiter, C. (1996): 'Engaging Students in a Knowledge Society', *Educational Leadership*, Vol. 54, No. 3, pp. 6-11.

Silvio, J. (1995): *Potential Users and Virtual Communities in the Academic World*, electronic document at Website: http://inet.nttam.com

Thornburg, D. D. (1995): 'Welcome to the communication age', *Internet Research*, Vol. 5, No. 1, pp. 64-70, electronic document at Website: http://www.mcb.co.uk/cgi-bin

Whitelock, D., Brna, P. and Holland, S. (1997): *What is the Value of Virtual Reality for Conceptual Learning? Towards a Theoretical Framework* (http://www.cbl.leeds.ac.uk//~euroaied/papers/Whitelock1/).

BEST COPY AVAILABLE

Appendix Computer applications in Distance Learning: Exemplar URLs

Source	URL reference
Virtual college Development Centre, Singapore Polytechnic	http://www.sp.ac.sg/department/vc/modules.htm
Open University Business School	http://oubs.open.ac.uk/
Computing dictionary: glossary	http://wombat.doc.ic.ac.uk/
Current issues and problems in educational media and computers	http://seamonkey.ed.asu.edu/~mcisaac/emc502.html
Delivering instruction on the WWW	http://www.edb.utexas.edu/coe/depts/ci/it/projects/wbi/wbi.html
Directory of educational URLs: hosted by NCET	http://www.ncet.org.uk:80/publications/highways/appenD.html
Distance Education Journal	http:www.usq.edu.au/dec/DECJourn/demain.htm
AskEric: Info Guide on Distance Education	http://ericir.syr.edu/
Goals and visions for a virtual university – Western Governors Association	http://206.26.55.1/smart/vu/vuvision.html
MIT Sloan business faculty, Peter Senge – organisational theory, learning organisations	http://web.mit.edu/sloan/www/faculty/senge.html
Open Learning Australia: university and vocational level courses with qualifications	http://www.ola.edu.au/
OpenNet online delivery of Flexible Learning	http:www.opennet.net.au/
Participatory Action Research: Cornell's homepage	http://parnet.org/
Department of Anatomy, National University of Singapore	http://ch.nus.sg:80/anatomy/html/anat.html
Technology & applications for the information age	http://www.npac.syr.edu/projects/cps616spring96/index.html
The Open University - homepage	http://www.open.ac.uk
Journal of Interactive Media in Education	http://www-jime.open.ac.uk/jime/01/jime-01-t.html
The WWW virtual library: e-journals	http://www.edoc.com/ejournal/
University of Illinois	http://www.online.uillinois.edu/
Use of the Internet to support teaching and learning	http://141.163.121.36/TeachingLearning/online.html

BEST COPY AVAILABLE